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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/690,580	10/17/2000	Vladislav Vashchenko	NSC1-H1500	3449

33402 7590 12/16/2002

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EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2814

DATE MAILED: 12/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/690,580

Applicant(s)

VASHCHENKO ET AL.

Examiner

Dana Farahani

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-17 and 20-24 is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowrey et al., hereinafter Lowrey (U.S. 5581104), previously cited in view of Delage et al., hereinafter Delage (U.S. 6031255), previously cited.

Lowrey discloses a bipolar transistor-based ESD protection structure comprising an N-type semiconductor substrate, figure 8, a bipolar transistor disposed in and on the semiconductor substrate, the bipolar transistor having a base region, shown as an N region, a collector region, shown as a P+ region connected to an input, and an emitter P+ connected to Vcc.

Lowrey does not disclose a heat sink.

Delage, in figure 9, discloses a heat sink region 101, integrated with the metal layer 94, adjacent to the emitter 40 and above the semiconductor substrate 10, in order to reduce the heat generated during an ESD event. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the heat sink Delage discloses in the Lowrey invention in order to reduce the heat generated.

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3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowrey and Delage as applied to claim 1, above, and further in view of Leuschner (U.S. 4724471).

Delage, as applied to Lowrey, does not disclose the heat sink is formed of polysilicon. However, Leuschner teaches in column 8, lines 16-20, using polysilicon layers in a heat sink. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the heat sink Delage discloses from polysilicon, as thought by Leuschner, in order to make a more efficient heat sink.

4. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowrey and Delage as applied to claim 1, above, and further in view of Akram (U.S. 6075288).

Regarding claims 3 and 4, Delage, as applied to Lowrey, does not disclose the heat sink region formed of metal layers.

Akram describes a floating heat sink formed of copper, aluminum, molybdenum, titanium, and alloys of these materials. (see column 3, lines 40-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the heat sink Delage discloses from the material Akram describes in order to form a heat sink with a high thermal conductivity, hence better heat dissipation.

Regarding claim 5, Akram, as applied to claims 3 and 4 above, does not disclose the heat sink is within 2 microns of the polysilicon emitter. However, it would have been an obvious matter of design choice to those skilled in the art to dispose the heat sink

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region within 2 microns of the polysilicon emitter since heat transfer by conduction is more efficient.

Allowable Subject Matter

5. Claims 10-17 and 20-24 are allowed.
6. The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for the indication of the allowability of claims 14-17 and 20-24 is the inclusion therein, in combination as currently claimed, of the limitation of the heat sink contact formed through the dielectric layer; contacting the top surface of the base region. This limitation is found in claims 14-17 and 20-24, and neither disclosed nor thought by the prior art of record, alone or in combination.

The primary reason for the indication of the allowability of claims 10-13 is applicant's argument that AAPA does not disclose an emitter contact wider than the emitter, and a base contact thinner than the emitter contact.

Response to Arguments

7. Applicant's arguments, regarding claims 1-6, filed on 7/12/02 have been considered but they are not persuasive.

Applicant argues that Lowrey does not teach the substrate is formed of polysilicon and as a result one skilled in the art would not understand that the substrate was polysilicon. This is not persuasive since using polysilicon instead of monosilicon is

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not patentably distinguishable over the prior art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use polysilicon, since it would have been readily available due to its usage in the heat sink of the device.

It was known in the art that both mono-crystal and polysilicon substrates are used in the art.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

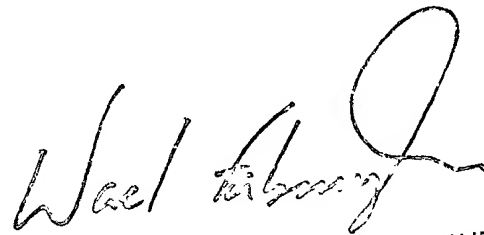
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703)308-4918. The fax phone numbers

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for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
December 10, 2002

A handwritten signature in black ink, appearing to read "Wael Farahani". The signature is fluid and cursive, with a large loop at the end.

SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800